

The role of the Italian research in food science and technology in knowledge transfer

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President of SISTAL
University of Reggio Calabria

Sistal – Italian Society of Food Science and Technology

The Society wants contribute to scientific development of preservation, processing, packaging, quality management and other topics related to food.

The members of the society are researchers and teachers belonging to “Food Science and Technology” academic discipline of Italian Universities

146 members of The Society
28 universities represented



Research Areas of SISTAI

Products subject matter

Fresh vegetables, Minimally treated vegetables,
Canned vegetables
Fats and olive oil
Wine, Brew and Distilled
Milk and Dairy products,
Meat, Canned derived meat , salami,
Fish and Canned fish
Ready meals
Cereals, Bread, baked, pasta
Functional foods
By-products of food industries

Food Operations/technologies/methods

- Unit Operations of Food Industry
- Packaging and shelf life
- Thermal treatments and Cooking
- Non-conventional technologies: dielectric, Radiofrequencies, Microwaves, High Pressures, Ultrasounds, Pulsed Electric Fields, others.
- Extraction, fractionation and separation technologies.
- Hurdle technology
- Plant sanification
- Nanotechnologies

Evaluation of starting materials and derived food

- Chemical and physical evaluation Sensorial analysis and consumer science

Food product requirements

- nutritional, healthy, hedonistic and social.
- Respect other necessities food products are highly distinguished by:
 - Consumption
 - Quality
 - Life cycle and seasonality

Economical Importance of Food (Agri-food) sector in EU

- Sales volume of 1109 billion of € (- 0.5 % compared to 2015)
- 294 000 enterprises (20 % with more than 9 employees) (2016)
- 4.57 million people employees (dati 2016)
- 15 is the average of number of persons employed per company (2015)

(Data from FoodDrink Europe 2018)

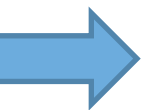
Economical Importance of Food (Agri-food) sector in Italy

- Sales volume of 140 billion of € (+ 2 % compared to 2017)
- 58 000 enterprises (6.850 with more than 9 employees) (2017)
- 385 000 employees (dati 2017)
- 32.9 billion exported (+3 % compared to 2017)
- 21.8 billion imported (- 1.8 % compared to 2017)

(Data from Federalimentare reports, 2018)

Made in Italy: the numbers of the food quality productions

Italy measures the highest number of certified foods (Geographical Indications such as PDO, PGI and Traditionally Specialties): 822



Total Economical value of PDO + PGI \approx 15.2 billion €

Food (no wine) 299 products PDO and PGI : 7 billion €
cheeses and salami are the 85% of the total value of PDO/PGI productions

Wine (523 registered): 8.3 billion €
PDO / PGI wines correspond to 2/3 of the whole Italian production
More than 500 wines certified and registred

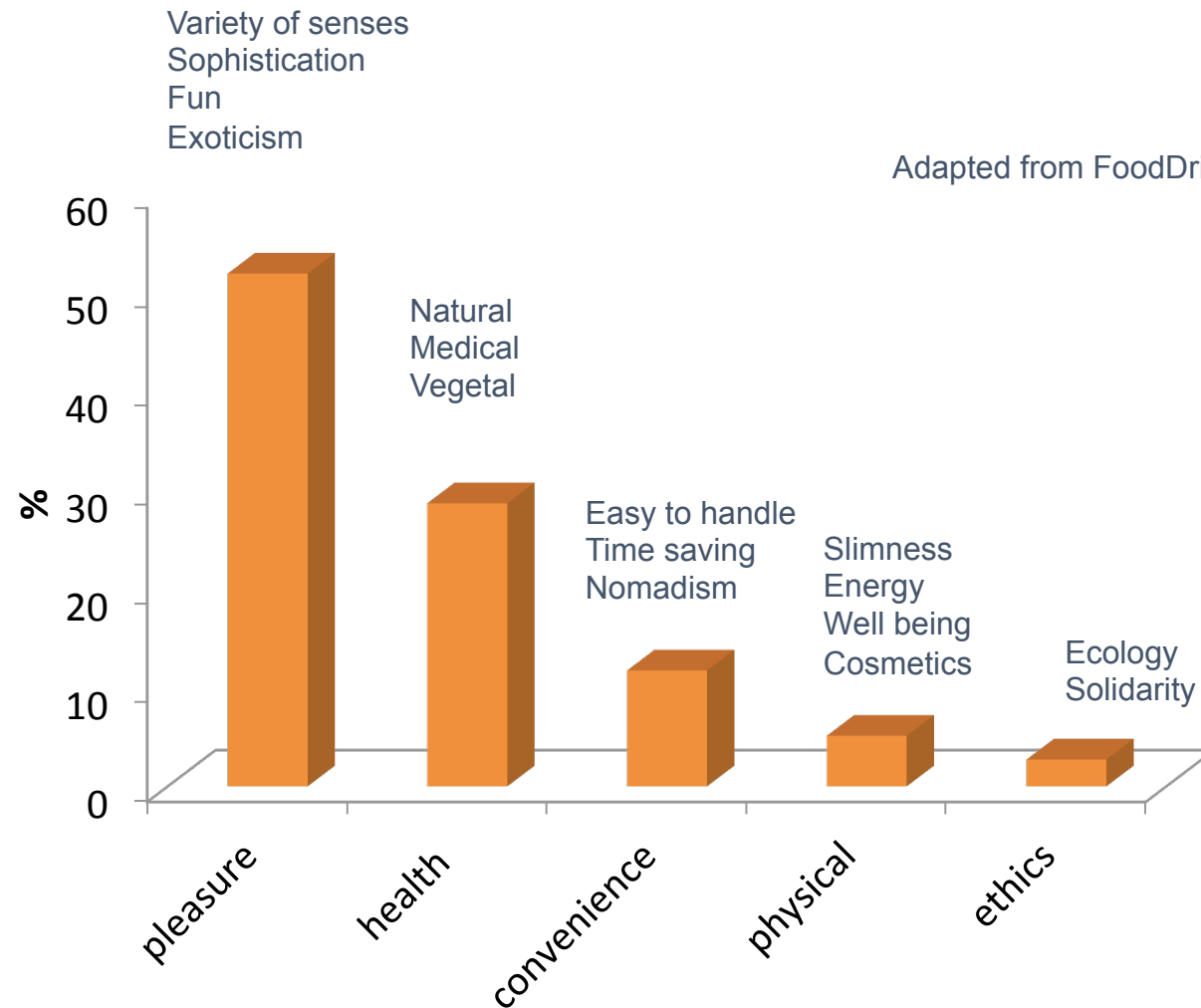
Quality of made in Italy foodstuff

Tied to territory

- Typical
- Mediterranean diet

Food from new processes and new formulations

Drivers of innovation in Europe



FOOD SCIENCE AND TECHNOLOGY REASEARCH IN ITALY

WHAT

- New processes
- New ingredients

FOR

- Valorizing traditional foods
- Developing new foods
- Preserving Food quality

FOOD PROPERTIES TO BE SATISFIED

Tied to territory/Typical
Meeting the Mediterranean
diet requirements

Healthy

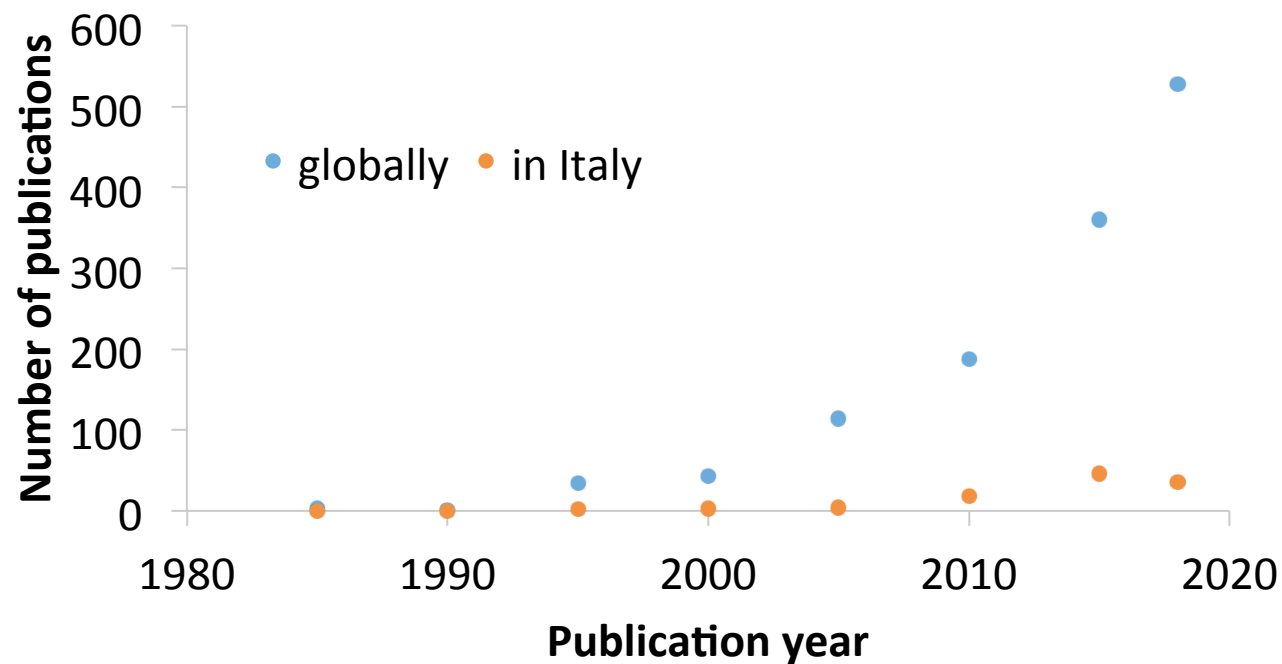
Convenient

Hedonistic

....

(in other words, responding to
actual consumers demands)

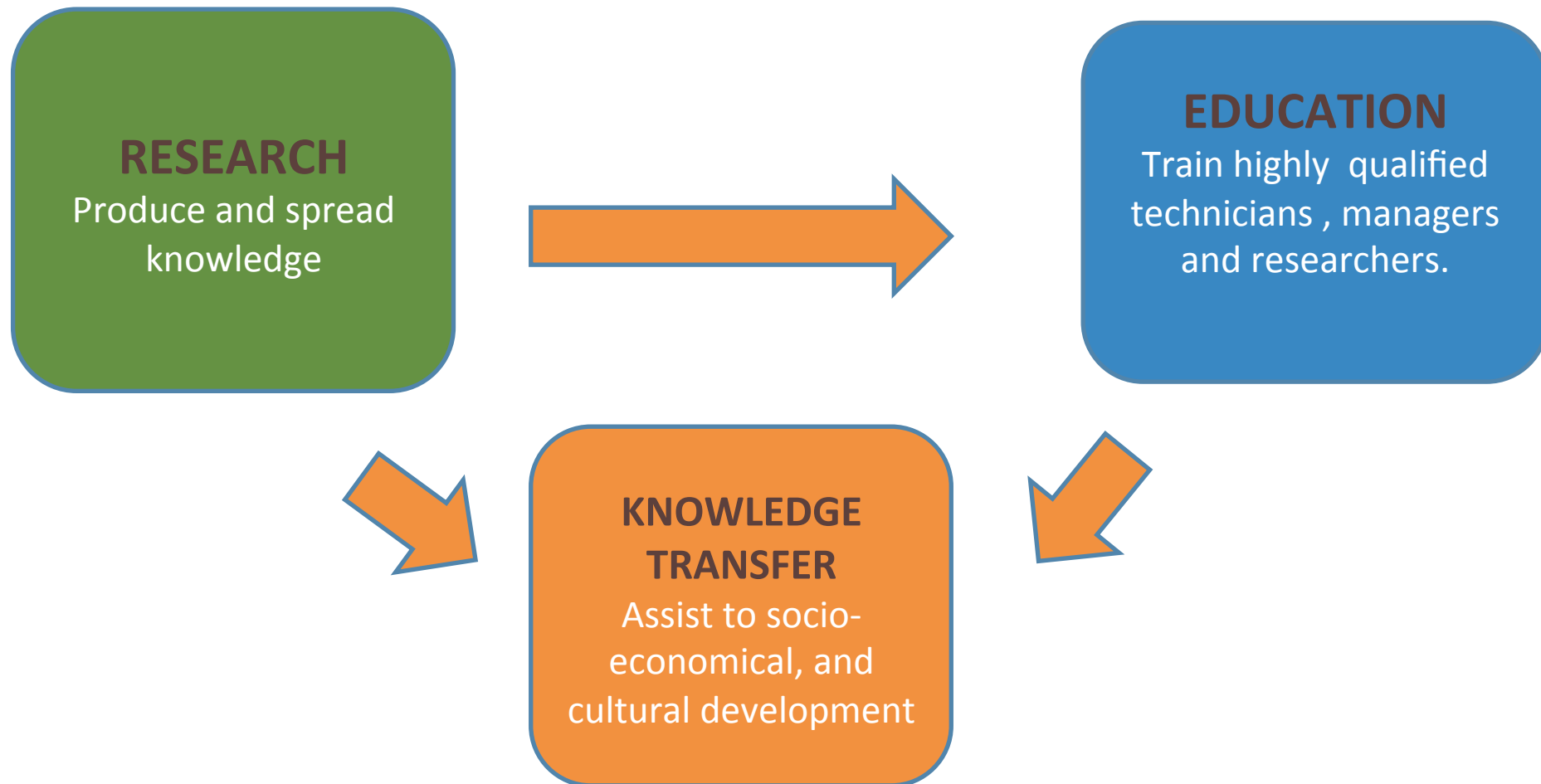
S&T Research and Innovation



Number of scientific articles published per year with the search of words “Innovative food processing/technology” refine in Food science and technology

Web of Science, Thomson Scientific

Academic missions and Knowledge transfer



CREATING VALUE FROM FOOD SCIENCE AND TECHNOLOGY RESEARCH

The Italian Network of the PhD Courses in Food Science, Technology

- The network is participated by 28 PhD courses of 26 Italian Universities
- Annual workshops, (XXIV, 2019)
- PhD students present their PhD activities as poster or oral presentations (3d year)
- At the annual workshops about 30-35 of 3d year students and about 120 of the 1 st and 2 nd.



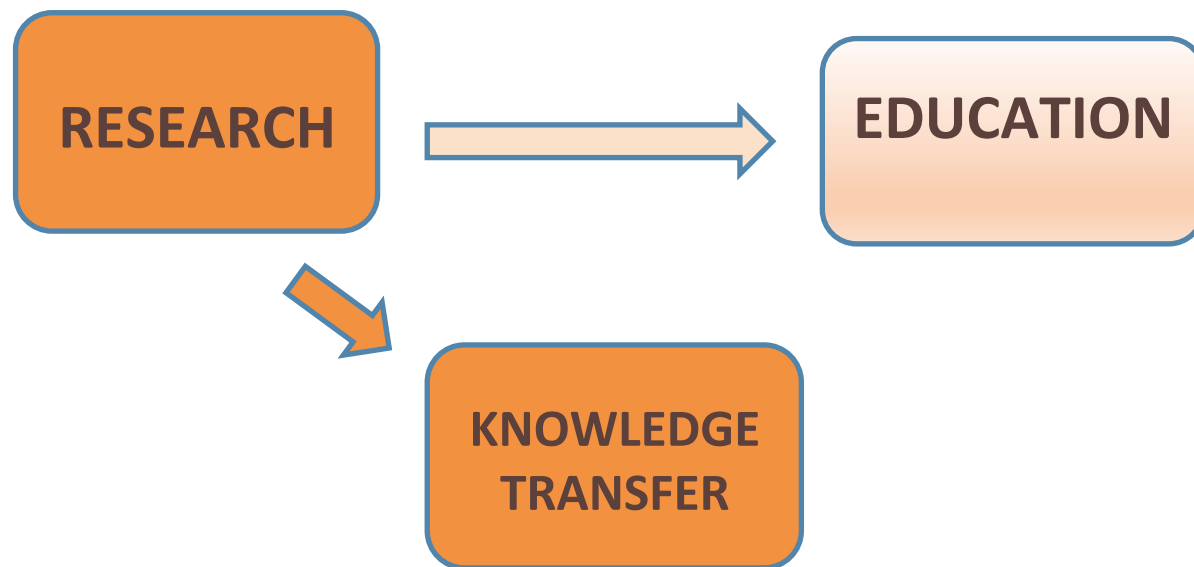
The Italian Network of the PhD Courses in Food Science, Technology

“What for” Award organized (4th edition this year)

- The award aimed at 3d-year students:
 - favoring the orientation of training courses towards issues of industrial interest;
 - attracting knowledgeable and motivated young researchers in food industries.
- Promotes awareness among young researchers of the effects of the application of the research carried out by them and the ability to communicate (by mean of a short video), in a synthetic and effective way, how to promote technological transfer.
- Participants highlights the innovative relevance and the practical impact of the PhD research for the industry;



an research in FS&T contribution to knowledge: examples



an research in FS&T contribution to knowledge: examples

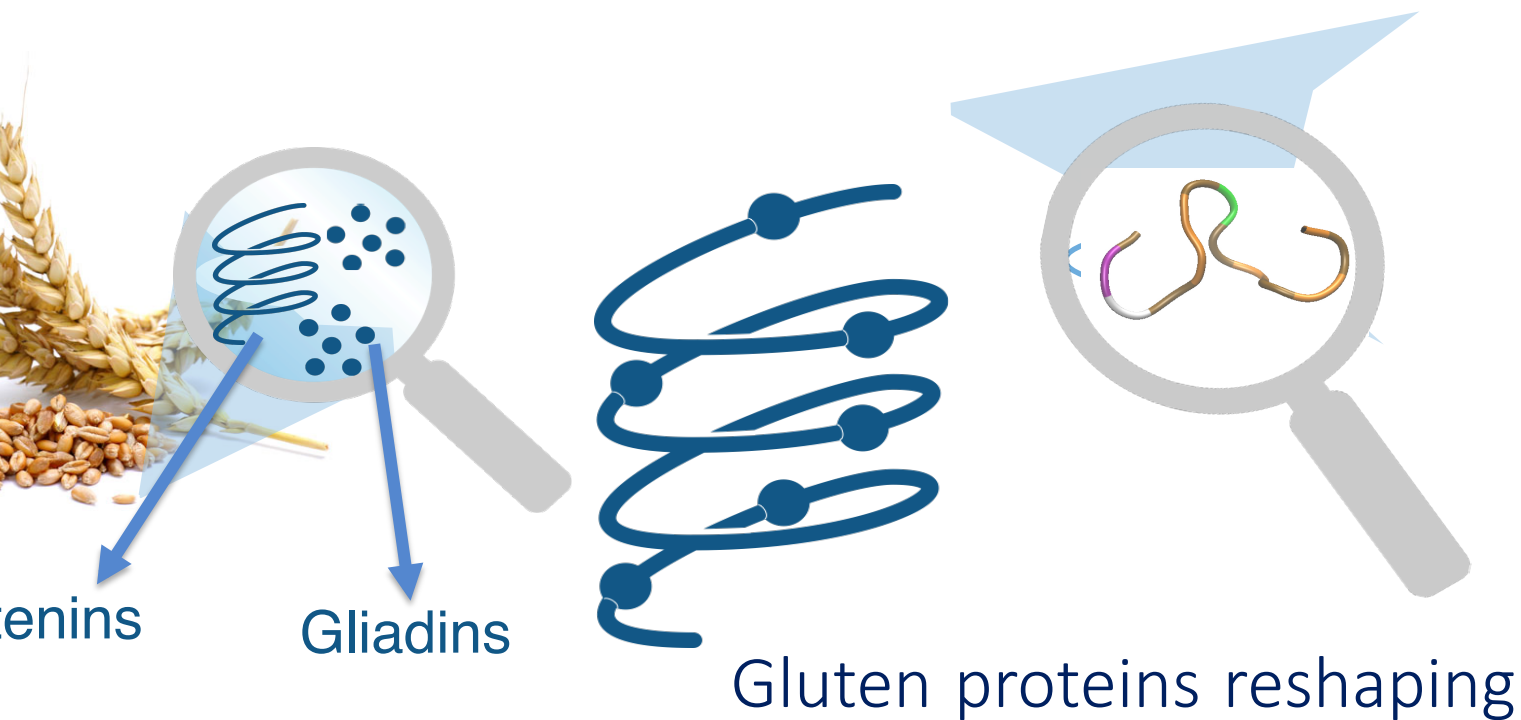
GLUTEN FRIENDLY™

University of Foggia (Lamacchia; Di Luccia; Gianfrani)

Italian Patents: N° 0001414717 , N°. 102015000084813

European Patent: EP3389400

Spin-off: New Gluten World (Researchers UniFG & Industrial Label)

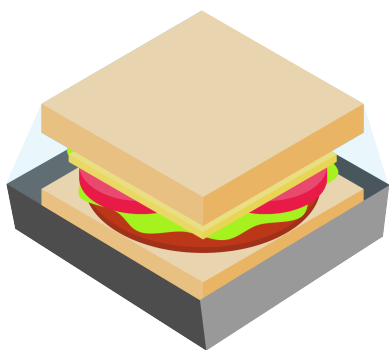


Chemical-physical process applied to wheat kernels before milling.

The patented formula is a precise pacing of water, high heat, and resting times.

The process apply to wheat kernel, where gluten proteins shape into a new molecular structure, without any denaturation.

an research in FS&T contribution to knowledge: examples



GLUTEN FRIENDLY™
FLOUR CONTRASTS
FOODBORNE
PATHOGENS



GLUTEN FRIENDLY™
FLOUR BOOSTS THE
EFFECT OF
PROBIOTICS



GLUTEN FRIENDLY™
BREAD STIMULATES
MUCUS PRODUCTION
IN THE INTESTINE

Italian Research in FS&T contribution to knowledge: examples

METHOD TO MAKE FAT SUBSTITUTE AND/OR FAT IMITATOR COMPOUNDS

University of Udine (Calligaris, Plazzotta,
Manzocco)

Patent n. WO2018/007399

The invention deals with a method for production of a fat
substituted with low content of saturated fats.

The novel fat has rheological properties comparable to that of
margarines, widely applied in the production of
laminated products (e.g. croissants).

	Saturated fat %
sunflower oil	47
Butter	49
EU Patent	23



an research in FS&T contribution to knowledge: examples

MULIN-BASED COMBINATION AND AS SUBSTITUTE OF FATS IN FOOD POSITIONS AND FORMULATIONS

University of Foggia (Severini, Fiore, Derossi)
Patents: IT 102016000097941 / EP 3300611A
Hong Kong 18111212.9



emulsion of inulin, water and fat with a low content of saturated fatty acids and cholesterol (EVOO).

can be used as substitution of animal or hydrogenated fats, since it can be obtained in different degrees of viscosity and therefore applicable to different food formulations.

an research in FS&T contribution to knowledge: examples

METHOD OF PRODUCTION AND STABILIZATION OF V GAMMA FISH FILLETS

duction and stabilization of V gamma
fillets by the use of marinating solution,
um packaging and partial cooking by
rowave.



Marinated Anchovy fillets :
MT = (traditional marinating
10% salt 12% vinegar)
MI = (innovative marinating)

Marinated salmon fillets:
MI = (innovative marinating)
MT = (traditional marinating
10% salt 12% vinegar)



Method of production and stabilization that avoids the problems related to a market
sensory impact in terms of taste, texture and color of the final product.

an research in FS&T contribution to knowledge: examples

VALORISATION OF CACAO BY-PRODUCTS

University of Turin (Zeppa) Italian patent N. 102016000123836

Source of Bioactive Compounds

- Fatty acids
- Minerals (Mg, K, P, Fe)
- Fiber
- Polyphenols

Industrial Residue – by-product

- 523 thousand of tonnes (2013/2014)
- Environmental impact
- Find new strategies of recycling



RECOVERY AND VALORISATION

Pharmaceutical industry

Cosmetic

Chemical industry

Food industry

Preservation (antioxidants, antimicrobials) Active Packaging Dietary Supplement Functional Foods



Bread

Cocoa Bean Shell



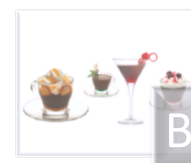
Cheese



Ice cream



Yogurt



Beverages



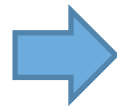
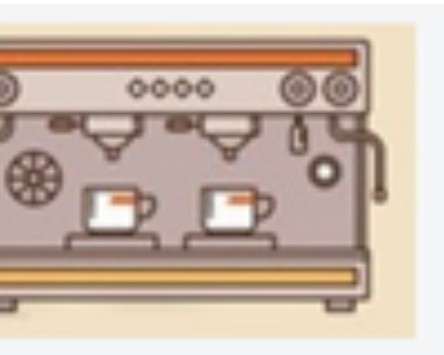
Biscuits

an research in FS&T contribution to knowledge: examples

BIO-MATERIALS FROM EXHAUSTED CAFFE'

University of Foggia (Severini, De Pilli, Derossi) Ital
patent N. 102014902305083

In cooperation with Italian Industry of Caffè



Exhausted cake Caffee



Caffee shop

Caffee capsules
for automatic
machines



an research in FS&T contribution to knowledge: examples

Infrastructural lab for
active and sustainable
packaging application

*Application of advanced
technologies to obtain active and
eco-friendly packaging*



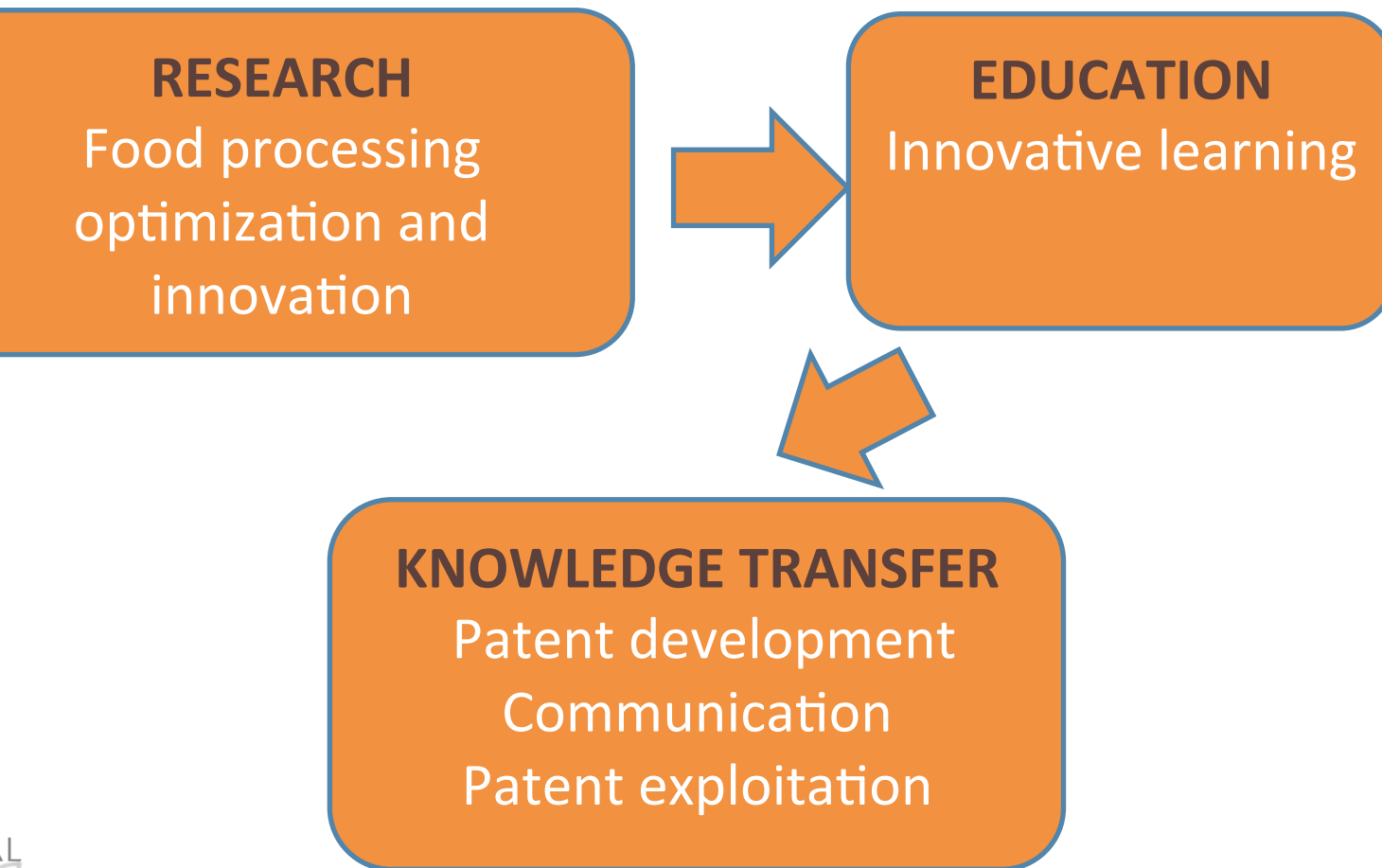
ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
CENTRO INTERDIPARTIMENTALE
DI RICERCA INDUSTRIALE AGROALIMENTARE



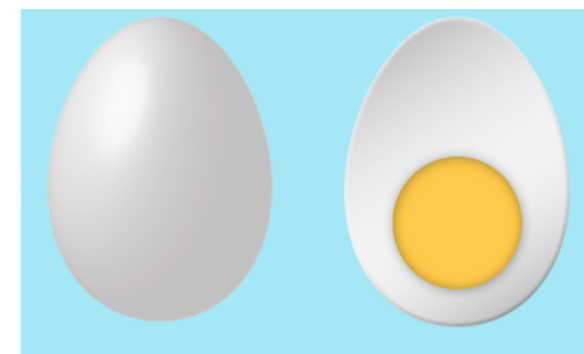
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Italian Research & Education in FS&T contribution to knowledge: some examples

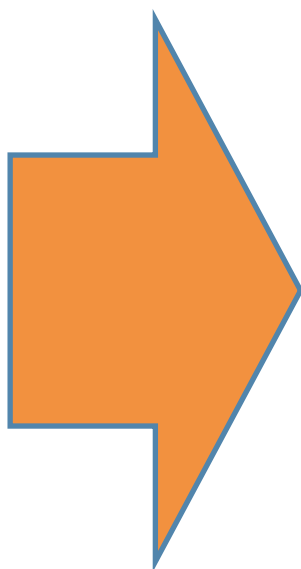


The case of the
Vegetable
boiled egg



EDUCATION

Innovative learning



CREATING VALUE FROM RESEARCH - Rome, September 18,
2019



August 2017: Italian patent «Prodotto alimentare innovativo e relativo processo produttivo»

PROPERTY: The University of Udine

INVENTORS: 4 students of the master course in food science and technology of the University of Udine



Il primo uovo senza gallina

Le quattro studentesse dell'università di Udine: vegano al 100%. E chi ha alti livelli di colesterolo potrà mangiarne quanti ne vorrà

di *Marco Formica*



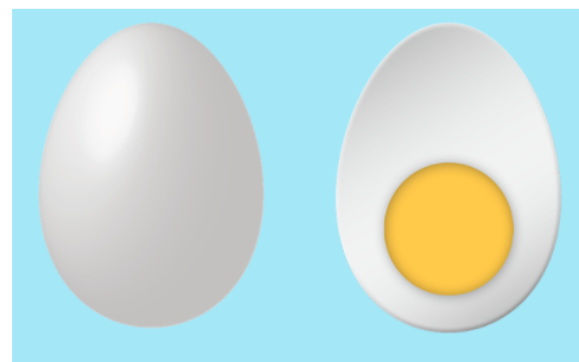
VegNews

News Food Planet Travel Buzz

News

Students Develop Vegan Replica of Hard-Boiled Egg

By *Anna Starostinetskaya* | settembre 18, 2017



University of Udine master's students obtain a patent for the cholesterol-free, ready-to-eat egg that features a wholly plant-based white and yolk.

KNOWLEDGE TRANSFER
Communication



Linea Verde, Rai 1, 13 January 13th

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Patent exploitation





Thank you for your kind attention